



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,217	05/11/2001	Douglas E. Weiss	55944USA9A.002	6357

32692 7590 09/29/2003

3M INNOVATIVE PROPERTIES COMPANY  
PO BOX 33427  
ST. PAUL, MN 55133-3427

[REDACTED] EXAMINER

TSOY, ELENA

[REDACTED] ART UNIT

[REDACTED] PAPER NUMBER

1762

DATE MAILED: 09/29/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/853,217	WEISS ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Elena Tsoy	1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 11 May 2001.
- 2a) This action is FINAL.                  2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.
- 4) Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 18-22 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-17 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Disposition of Claims

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a)  The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                    | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                           | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2-5</u> . | 6) <input type="checkbox"/> Other: _____                                    |

***Election/Restrictions***

1. Applicant's election with traverse of Claims 1-17 in Paper No. 9 is acknowledged. The traversal is on the ground(s) that search of all groups will be interrelated because the inventions of Groups I, II, III are in same class and classification in different subclasses is not sufficient ground to require restriction. This is not found persuasive because have acquired a separate status in the art as shown by their different classification and their recognized divergent subject matter, and the search required for Group I is not required for Group II and III, restriction for examination purposes as indicated is proper.

The requirement is still deemed proper and is therefore made FINAL.

---

***Claim Objections***

2. Claim 4 is objected to because of the following informalities: "tridecul acrylate" seems to be incorrect. Appropriate correction is required. For examining purposes the phrase was interpreted as "tridecyl acrylate".

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.  
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 5, 6, 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Priou (US 6,590,009).

Priou discloses a polymerization method comprising: a) providing a substrate; b) coating at least a portion of said substrate with a polymerizable composition (See column 1, lines 51-54); c) providing an electron beam that is capable of producing pulsed beam of accelerated electrons (See column 8, lines 12-19); and d) irradiating said polymerizable composition with said beam of accelerated electrons to polymerize said polymerizable composition (See column 2, lines 17-26).

A polymerizable composition comprises polymerizable monomers, oligomers and/or polymers such as trimethylolpropane triacrylate (crosslinking agent), tripropylene glycol diacrylate, pentaerythritol triacrylate (See column 7, lines 25-26) with at least one comonomer (See column 7, lines 9-24).

5. Claims 1-8, 10, 14, 15 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 00/04055.

WO 00/04055 discloses a polymerization method comprising: a) providing a substrate; b) coating at least a portion of said substrate with an adhesive syrup (polymerizable composition); c) providing an electron beam that is capable of producing a beam of accelerated electrons; and d) irradiating said polymerizable composition with said beam of accelerated electrons at a temperature below 20°C (See page 11, lines 1-12) to polymerize said polymerizable composition (See Abstract). The polymerizable composition comprises polymerizable C<sub>8</sub>-C<sub>13</sub>-alkyl acrylate monomers such as isoctyl acrylate, 2-ethylhexyl acrylate (See page 3, lines 27-32), and one or more copolymerizable monomers such as acrylic acid, N-vinyl pyrrolidone, octylacrylamide, methyl methacrylate and isobornyl acrylate (See page 7, lines 15-24), and crosslinking agents

(See page 8). WO 00/04055 further teaches that high conversion of monomer to polymer (i.e., greater than 90%) may be achieved by decreasing the flux of electrons and increasing residence time with residence time of 2-20 seconds (See page 11, lines 18-32) using any suitable method including a shuttle system communicating an **on-off switch** for the electron beam generator (*pulsed electron beam*) (See page 12, lines 1-3).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-9, 14, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/04079 in view of Loda (US 4,163,172).

WO 00/04079 discloses a polymerization method comprising: a) providing a substrate; b) coating at least a portion of said substrate with a polymerizable emulsion-based composition; c) providing an electron beam that is capable of producing a beam of accelerated electrons; and d) irradiating said polymerizable composition with said beam of accelerated electrons to polymerize (heterogeneously) said emulsion-based polymerizable composition (See page 3). The polymerizable composition comprises polymerizable oligomers and monomers (See page 4, lines 10-16) such as C<sub>3</sub>-C<sub>13</sub>-alkyl acrylate, e.g. isoctyl acrylate, 2-ethylhexyl acrylate, isobornyl acrylate, and tridecyl acrylate, acrylic acid, methyl methacrylate (See page 8, lines 1-13), and crosslinking and thickening agents (See page 7, lines 4-6). Generally, the temperature during

coating and curing stages should be between  $5^{\circ}\text{C}$ - $30^{\circ}\text{C}$  (See page 24, lines 1-8). WO 00/04079 further teaches that desired dose rates can be achieved by manipulating residence time. Higher dose rates may cause lower molecular weight polymers, lower dose rates may allow for higher molecular weight, but require longer processing time; higher total dose may allow for higher conversion of the monomer to polymer, but may cause excessive crosslinking (See page 20, lines 32+). In other words, dose rate, total dose and residence time are result-effective parameters in a curing process.

WO 00/04079 fails to teach that the electron beam is a pulsed electron beam (Claim 1).

Loda teaches that polymerization is affected not only by the radiation dose, that is, the total amount of radiation directed onto the material, but also by the rate at which the dose is delivered. The high dose rate of very short electron beam pulses, of the order of microseconds, elicits chemical reactions, which may be different from those produced by the impact of long pulses or continuous radiation. See column 1, lines 54-60. In other words, a secondary reference of Loda is relied upon to show that pulsed electron beam elicits chemical reactions different from those produced by continuous radiation polymerization.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the electron beam in a polymerization method of WO 00/04079 either in a pulse mode or continuous mode depending on desired chemical reactions since Loda teaches that pulsed electron beam elicits chemical reactions different from those produced by continuous radiation polymerization.

8. Claims 10-13, 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/04079 in view of Loda (US 4,163,172), as applied above, and further in view of Botman et al (Nuclear Instruments and Methods in Physics Research B 139).

WO 00/04079 in view of Loda, as applied above, fails to teach that the polymerizable composition is irradiated with pulses of accelerated electrons during a residence time of about 1.5 seconds to about 5 seconds (Claim 10) at a pulse rate of about 25 to about 3,000 pulses per second (Claim 12); with said pulses of accelerated electrons having a dose per pulse of up to about 500 Gy (Claim 11) or of about 10 to 30 Gy (Claim 13); the polymerizable composition is polymerized heterogeneously (Claim 17) in a single phase (Claim 16).

---

Botman et al teach that methyl methacrylate monomer (MMA) applied to PMMA latex seeds (substrate) (See page 493, column 2, paragraph 2) may be polymerized heterogeneously to form a new polymer at irradiating conditions, which include dose per pulse between 0.1-3 Gy, pulse rate of 1-50 Hz (See Abstract), with a total dose of 160-550 Gy (See page 492, column 1, paragraph 1). In other words, a secondary reference of Botman et al is relied upon to show that irradiating conditions similar to those of claimed invention may be used for polymerizing MMA monomer applied to a substrate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used irradiating conditions of Botman et al (which are similar to those of claims 10-13, 16, 17) for polymerizing acrylic monomer applied to a substrate in a method of WO 00/04079 in view of Loda with the expectation of providing the desired curing, since Botman et al teach that irradiating conditions similar to those of claimed invention may be used for polymerizing MMA monomer applied to a substrate.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is (703) 605-1171. The examiner can normally be reached on Mo-Thur. 9:00-7:30, Mo-Thu.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding  
should be directed to the receptionist whose telephone number is (703) 308-0661.



Elena Tsoy  
Examiner  
Art Unit 1762

September 3, 2003